Amendments to the Drawings

The Examiner has objected to the drawings, "because they include the following reference sign(s) not mentioned in the description: 100, 200, 300, 400, 500, 600, 700, 800." Applicant has amended the drawings to omit reference to such signs. Copies of the replacement drawings are provided in the appendix at the end of this paper. Accordingly, Applicant respectfully requests that the Examiner withdraw the drawing objections.

Attachment: Replacement Sheet(s)

REMARKS

Claims 1-11 and 14-22 are pending in the application. Claims 12 and 13 are canceled by the above amendments, and claim 22 is newly presented. The Examiner has indicated that claim 10 is allowable. The Examiner has indicated that claims 2, 3, 5, 7, and 17 would be allowable if rewritten in independent form including the subject matter of the base claim and any intervening claims. The indications of allowable subject matter are noted with appreciation. The Examiner has rejected claims 1, 4, 6, 8, 9, 11-16, and 18-21.

Applicant has amended claims 1, 11, 14, and 16 to recite additional aspects of Applicant's invention. Applicant has amended several paragraphs of the specification to effect minor clerical revisions to the specification. Applicant has amended the drawings in the manner suggested by the Examiner.

REJECTIONS UNDER 35 U.S.C. 102(e)

The Examiner has rejected claims 11-13 under 35 U.S.C. 102(e) as being anticipated by US Patent 5,208,882 to Strasser et al. Applicant has amended claim 11 to recite "a waveguide comprising a vertically tapered portion and a non-vertically tapered portion; and a diffraction grating disposed at the non-vertically tapered portion...". Support for the amendment of claim 11 can be found in the specification at least at paragraph [0140].

In contrast, Strasser discloses a tapered portion overlaying a grating. (Abstract. See also column 3, line 61- column 4, line 25.) Strasser discloses that the tapered portion is disposed over the grating so that an incident beam diffracted off the grating can interact with the tapered portion of the guiding film in order to change the angular acceptance of the grating coupler:

> An incident beam 18 is diffracted off the grating 12 at the interface of the waveguide 14 and substrate 10. The diffracted beam undergoes total internal reflection off the tapered portion of the guiding film 12. The taper changes the propagation angle within the waveguide such that upon leaving the tapered region, the beam is traveling at the correct propagation angle for the guided mode.
> The taper changes the angular acceptance of the grating coupler 12 through two effects. The first effect is that a beam diffracted from the grating undergoes different numbers of bounces off the taper, depending on the diffraction angle. Because each bounce changes the propagation angle in the

waveguide, bouncing can be used to compensate for the changes in propagation angle with incidence angle. (Column 4, lines 3-19.)

Therefore, Strasser does not disclose Applicant's claimed feature of "a diffraction grating disposed at the non-vertically tapered portion...". For at least this reason, Applicant respectfully requests that the Examiner withdraw the rejection of claim 11. Applicant has canceled claims 12 and 13 rendering the rejection of such claims moot.

REJECTIONS UNDER 35 U.S.C. 103(a)

The Examiner has rejected claims 1, 4, 6, 8, 9, 14-16, and 18-21 under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,292,609 to Matsushima et al.

As recited in independent claim 1, Applicant's claimed invention relates to a method for manufacturing an optical device "wherein at least two areas of the optical waveguide material are exposed to variable amounts of etchant ions...". (Emphasis Added.) As recited in independent claim 14, Applicant's claimed invention relates to a method for forming a waveguide with a vertical taper comprising "exposing the waveguide to an ion etching process, so that a vertical taper is formed in the waveguide." (Emphasis Added.)

In making the rejections, the Examiner states that " Matsushima et al. discloses... a source of etchant ions, wherein the motion of the waveguide exposes at least two areas of the optical waveguide material to variable amounts of etchant ions...". Applicant respectfully disagrees with the Examiner's reading of Matsushima.

Matsushima does not disclose or suggest exposing a waveguide to an ion etching process. To the contrary, the Matsushima process comprises etching with a laser beam. Matsushima discloses that "[t]here is featured a processing method for processing a target body that includes setting a beam area formed by a laser beam on the organic insulating film ...The method also includes, subsequently moving the organic insulating film toward the irradiated region of the laser beam... This enables the resultant processed target surface to be smooth and free from reaction product including decomposed segments of the target body. " (Abstract. Emphasis Added.) Likewise, throughout the detailed description of Matsushima the use of a laser beam is disclosed. The words "ion" and ions" do not appear anywhere within the detailed description of Matsushima.

Moreover, ***Matsushima specifically teaches away from ion etching*** using an excimer laser etching to solve the problems identified and overcome by Matsushima. Specifically, in the background Matsushima states that

> the surface tapered according to any of the preceding methods still fails to provide satisfactory levels of smoothness or finishing conditions and suffers from side production of foreign bodies, such as residua and cut-out dust, and from damage incurred on elements.
> Accordingly, to solve the above problems, the use of a laser is suggested as a method of tapering a surface....
> Since there chiefly occurs an optical decomposition reaction in the excimer laser process as above, etching can be performed with little adverse thermal effect. Therefore, in comparison to RIE (Reactive Ion Etching) ..., excimer laser processing techniques are characterised by cleanness of processed shapes... (Column 1, lines 62- column 2, line 2; column 2, lines 31-37. Emphasis Added.)

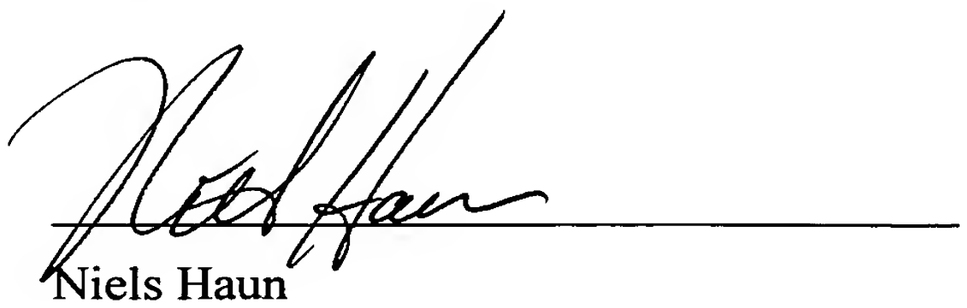
That is, Matsushima specifically teaches that in order to solve the problems of achieving surface finishes with satisfactory levels of smoothness, etching with an excimer laser should be used.

Hence, Matsushima does not disclose, ***and teaches away from***, Applicant's claimed method for manufacturing an optical device "wherein at least two areas of the optical waveguide material are exposed to variable amounts of etchant ions...", as recited in independent claim 14. (Emphasis Added.) Nor does Matsushima disclose Applicant's claimed method for forming a waveguide with a vertical taper comprising "exposing the waveguide to an ion etching process, so that a vertical taper is formed in the waveguide", as recited in independent claim 14. (Emphasis Added.) Accordingly, for at least these reasons, Applicant respectfully requests that the Examiner withdraw the rejections of independent claims 1 and 14, as well as claims 4, 6, 8, 9, 15, 16, and 18-21, which depend respectively therefrom.

In view of the foregoing amendments and remarks, it is believed that the claims in this application are now in condition for allowance. Early and favorable reconsideration is

respectfully requested. The Examiner is invited to telephone the undersigned in the event that a telephone interview will advance prosecution of this application.

Respectfully submitted,



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